FINAL EXPLANATION OF SIGNIFICANT DIFFERENCES

Parcel B, Hunters Point Shipyard Site
San Francisco, California

May 4, 2000

I. Introduction

This Explanation of Significant Differences (ESD) updates the soil cleanup values presented in Table 8 of the Record of Decision for Parcel B, Hunters Point Shipyard (the Site) dated October 7, 1997 (Parcel B ROD). In the Parcel B ROD, the soil cleanup values presented in Table 8 were calculated to correspond to:

- A human health risk level of 10^{-6} (one in one million) or less for carcinogens except where ambient levels exceed 10^{-6}.
- A hazard index (HI) of 1 or less for noncarcinogens, except where ambient levels exceed an HI of 1 because of the fill material.
- Lead levels of less than 221 milligrams per kilogram (mg/kg).

The soil cleanup values were based on the U.S. Environmental Protection Agency, Region IX (EPA) 1995 preliminary remediation goals (PRG) with Navy adjustments to incorporate the produce uptake pathway and Hunters Point Shipyard ambient levels (HPAL) for metals (only). This ESD revises the soil cleanup values presented in Table 8 to incorporate EPA's 1999 PRGs and the revised nickel ambient levels. Attachment A to this ESD presents the original and revised Table 8 values.

The selected remedy in the Parcel B ROD includes the excavation of contaminated soils to the groundwater table, offsite disposal of the excavated soils, groundwater monitoring to ensure protection of San Francisco Bay from contaminated groundwater and institutional controls prohibiting all uses of groundwater and governing handling of any residual contaminated soils.

In August 1998, the Base Realignment and Closure (BRAC) Cleanup Team (BCT) approved an ESD to revise the selected remedy of the Parcel B ROD to require cleanup of contaminated soils to a maximum depth of 10 feet versus the groundwater table.

The preparation and public notice of this ESD is pursuant to Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), 42 U.S.C. Section 9617(c). This ESD is available for review at two information repositories: the Anna E. Waden Branch Library located at 5075 Third Street in San Francisco and the City of San Francisco's Main Library located at 100 Larkin Street. The information repositories are available during normal library hours. This ESD will become part of the Administrative Record for the Site, which can be accessed by contacting Ms. Diane Silva, Naval Facilities Engineering Command, Engineering Field Division, Southwest (SWDIV), at (619) 532-3676.

II. Summary of Site History and Selected Remedy

The Site is a deactivated shipyard located in southeastern portion of San Francisco, California, adjacent to San Francisco Bay. The Site consists of 936 acres, 493 on land and 443 under water in San Francisco Bay. In 1940, the Navy obtained ownership of the shipyard for ship building, repair and maintenance activities. After World War II, activities shifted from ship repair to submarine servicing and testing. Between 1976 and 1986, the Navy leased most of the Site to Triple A Machine Shop, a private ship-repair company. The Site was an annex of Naval Station Treasure Island until March 1994 when the Navy's Engineering Field Activity, West (EFA West) assumed management of the property. In October 1999, SWDIV assumed management of the Site.

In 1987, the Navy initiated studies confirming contamination was present at a number of Site locations. These findings, combined with the proximity to an off-site drinking water source (the aquifer used by the Albion Springs water bottling company), resulted in the EPA placing the Site on the National Priorities List (NPL), in 1989. In 1991, the Department of Defense listed the Site for closure.

In January 1992, the Navy, the EPA, California Department of Toxic Substances Control (DTSC), and the California Regional Water Quality Control Board (RWQCB) entered into a Federal Facility Agreement to coordinate the environmental investigation and cleanup of the Site. To expedite the investigation and cleanup, the Site was divided into six parcels: Parcels A through F.

This ESD pertains solely to remedial efforts at Parcel B. Investigation results at Parcel B showed that soils and groundwater have been impacted with a variety of hazardous substances including metals, polychlorinated biphenyls (PCB), volatile organic compounds (VOC), semivolatile organic compounds (SVOC), polynuclear aromatic hydrocarbons (PAH), and pesticides.

In the Parcel B ROD, the Navy selected excavation and offsite disposal as the final remedy for contaminated soils. The ROD also requires groundwater monitoring for up to 30 years to prevent any potential migration of contaminated groundwater into San Francisco Bay. In addition, steam and fuel lines are to be removed, storm drains are to be lined and pressure grouted as appropriate, and all future uses of groundwater will be prohibited by a deed restriction.

III. Description of Significant Differences and the Basis for those Differences

This ESD updates the soil cleanup levels presented in Table 8 of the Parcel B ROD to incorporate the EPA's current 1999 PRGs, including adjustments by the Navy to incorporate the produce uptake pathway, and the revised nickel ambient levels. The basis for these changes is presented below.

Change in EPA PRGs

When cleanup goals presented in Table 8 of the ROD were developed in 1995, they were consistent with EPA and state human health risk assessment guidance. Specifically, the cleanup levels correspond to an excess lifetime cancer risk (ELCR) of 1×10^{-6} assuming residential contact with soils, including the consumption of homegrown produce. Since 1995, EPA has updated the guidance for risk assessment input parameters for several classes of chemicals. Applying the revised guidance (1999 PRGs with adjustments to incorporate the produce uptake pathway as appropriate) results in revised chemical-specific cleanup levels in Table 8. Attachment A to this ESD presents the original and revised Table 8 values. Attachment B to this ESD includes calculations and technical information supporting the revised Table 8 values.

Change in Nickel Ambient Values

In July 1998, remedial action (RA) activities began at Parcel B. Nickel concentrations in soil samples collected from remediation areas excavated during the RA commonly exceeded the calculated HPAL. As a result, the Navy reviewed the approach used to calculate the HPAL for nickel and found that, while the nickel ambient concentrations were calculated based on a nickel-magnesium regression, chemical analysis of serpentinite samples at the site shows a consistently higher nickel to magnesium ratio. The Navy first hypothesized that the higher nickel to magnesium ratio was probably a consequence of weathering of serpentinite bedrock. DTSC, based on its independent research and field observations, agreed that preferential leaching of magnesium from serpentinite soil would occur as part of the soil weathering process. DTSC further pointed out that cobalt is not preferentially leached from weathered serpentine soils and a nickel-cobalt regression could be used. The resulting nickel-cobalt ratio should remain relatively the same as soils weather. Using this information, a new nickel-cobalt regression was formulated to calculate nickel ambient levels and was presented in the Nickel Screening and Implementation Plan Technical Memorandum dated August 4, 1999. Nickel ambient concentrations are not listed in Attachment A because they are sample-specific. However, they can be calculated from the specific cobalt concentrations using the following formula:

$$HPAL_{Ni\text{-}Co}=\exp[1.748+1.433(\ln Co)]$$

IV. Support Agency Comments

The EPA, DTSC and the RWQCB respectively concurred with updating the soil cleanup values addressed in this ESD for Parcel B in letters dated March 28, March 30, and March 23, 2000. This concurrence was provided because the soil cleanup goals in Table 8 were adjusted using the most recent PRG values which EPA Region 9 has developed. Further, the overall goals of the Parcel B ROD are not changed by this ESD. The selected remedy for Parcel B continues to be excavation of soils to a maximum depth of 10 feet to meet a human health risk level of 10^{-6} or less for carcinogens (except where ambient levels exceed this goal), an HI of 1 or less (except where ambient levels exceed this goal), and a lead level of 221 mg/kg.

V. Affirmation of the Statutory Determinations

The selected remedy for Parcel B as modified by this ESD continues to satisfy the requirements set forth in Section 121 of CERCLA. The Navy has determined that the revised soil cleanup levels continue to satisfy the statutory requirements of cleanup under the Superfund process. Considering the information that has been developed during implementation of the remedy and the proposed changes to the selected remedial soil cleanup goals, the Navy affirms that the updated soil cleanup goals remain protective of human health and the environment, and continue to comply with Federal and state requirements.

VI. Public Participation Activities

This ESD is available for review and comment by any member of the public at the two information repositories mentioned in Section I of this ESD. No public meetings are proposed for this ESD; however, a public comment period was conducted on the draft ESD from April 10 through April 24, 2000. This Final ESD will be advertised for a 30-day public notice from May 8, 2000 through June 7, 2000.

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Hunters Point Shipyard

4 May 00
Date

Daniel A. Meer
Chief
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5 May 00
Date

Anthony J. Landis, P.E.
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Department of Toxic Substances Control
California Environmental Protection Agency

9 May 00
Date

Lawrence P. Kolb
Acting Executive Director
California Regional Water Quality Control Board
San Francisco Bay Region

8 May 00
Date

Attachment A
Original and Revised Parcel B Soil Cleanup Levels

Chemical	95 HPAL	95 Reporting limit	95 PRG, no produce	95 PRG with produce	95 Cleanup Level	99 HPAL	99 Reporting limit	99 PRG, no produce	99 PRG with produce	99 Cleanup Level
	Soil concentration in milligrams per kilogram (mg/kg)					Soil concentration in milligrams per kilogram (mg/kg)				
1,1,1-TRICHLOROETHANE	--	0.01	3,200	12	12	--	0.01	770	--	770
1,1,2-TRICHLOROETHANE	--	0.01	1.4	0.030	0.030	--	0.01	0.84	--	0.84
1,1-DICHLOROETHENE	--	--	0.038	0.007	0.007	--	0.01	0.054	--	0.054
1,2,4-TRICHLOROBENZENE	--	0.33	620	28	28	--	0.33	650	--	650
1,2-DICHLOROBENZENE	--	0.33	2,300	160	160	--	0.33	370	--	370
1,2-DICHLOROETHANE	--	0.01	0.44	0.019	0.019	--	0.01	0.35	--	0.35
1,2-DICHLOROETHENE (TOTAL)	--	0.01	75	9.1	9.1	--	0.01	43[a]	--	43
1,4-DICHLOROBENZENE	--	0.33	7.4	0.22	0.33	--	0.33	3.4	--	1.9[b]
2,4-DIMETHYLPHENOL	--	0.33	1,300	28	28	--	0.33	1,200	29	29
2-BUTANONE (METHYL ETHYL KETONE)	--	0.01	8,700	62	62	--	0.01	7,300	--	7,300
2-METHYLNAPHTHALENE	--	0.33	800[c]	140	140	--	0.33	56[c]	--	56
4,4'-DDD	--	0.0033	1.9	0.17	0.17	--	0.0033	2.4	2.1	2.1
4,4'-DDE	--	0.0033	1.3	0.16	0.16	--	0.0033	1.7	1.6	1.6
4,4'-DDT	--	0.0033	1.3	0.040	0.040	--	0.0033	1.7	1.2	1.2
4-METHYL-2-PENTANONE (METHYL ISOBUTYL KETONE)	--	0.01	5,200	27	27	--	0.01	790	--	790
ACENAPHTHENE	--	0.33	360	140	140	--	0.33	3,700	--	3,700
ACENAPHTHYLENE	--	0.33	360[d]	130	130	--	0.33	3,700[d]	--	3,700
ALDRIN	--	0.0017	0.026	0.0015	0.0017	--	0.0017	0.029	0.024	0.024
ALPHA-CHLORDANE	--	0.0017	0.34[e]	0.28	0.28	--	0.0017	1.6[e]	0.32	0.32[f]
ALUMINUM	--	10	77,000	74,000	74,000	--	10	76,000	73,000	73,000
ANTHRACENE	--	0.33	19	970	970	--	0.33	22,000	--	22,000
ANTIMONY	9.1	1.2	31	10	10	9.1	1.2	31	10	10
ARSENIC	11	2	0.32	0.24	11	11	2	0.39	0.25	11
BARIUM	310	40	5,300	2,700	2,700	310	40	5,400	2,700	2,700
BENZENE	--	0.01	1.4	0.035	0.035	--	0.01	0.67	--	0.18[b]
BENZO(A)ANTHRACENE	--	--	0.61	0.12	0.12	--	0.33	0.62	0.37	0.37[f]
BENZO(A)PYRENE	--	0.33	0.061	0.016	0.33	--	0.33	0.062	0.037	0.33[f]
BENZO(B)FLUORANTHENE	--	--	0.61	0.030	0.030	--	0.33	0.62	0.34	0.34[f]
BENZO(G,H,I)PERYLENE	--	0.33	800[c]	360	360	--	0.33	2,300[g]	1,600	1,600
BENZO(K)FLUORANTHENE	--	0.33	6.1	0.030	0.33	--	0.33	6.2	0.34	0.34f
BENZOIC ACID	--	0.33	100,000	2,200	2,200	--	0.33	100,000	2,200	2,200
BERYLLIUM	0.71	0.8	0.14	0.7	0.8	0.71	0.8	150	140	140
BIS(2-ETHYLHEXYL)PHTHALATE	--	0.33	32	1.1	--	--	0.33	35	27	27
BROMOFORM	--	0.01	56	0.081	0.081	--	0.01	61	0.49	0.49
CADMIUM	3.1	1	38	3.1	3.1	3.1	1	37	3.5	3.5

Attachment A
Original and Revised Parcel B Soil Cleanup Levels

Chemical	Soil concentration in milligrams per kilogram (mg/kg)					Soil concentration in milligrams per kilogram (mg/kg)				
	95 HPAL	95 Reporting limit	95 PRG, no produce	95 PRG with produce	95 Cleanup Level	99 HPAL	99 Reporting limit	99 PRG, no produce	99 PRG with produce	99 Cleanup Level
CARBAZOLE	--	0.33	22	0.64	0.64	--	0.33	24	0.64	0.64
CARBON DISULFIDE	--	0.01	16	13	13	--	0.01	360	--	360
CARBON TETRACHLORIDE	--	0.01	0.47	0.074	0.074	--	0.01	0.24	--	0.086[b]
CHLOROBENZENE	--	0.01	160	22	22	--	0.01	150	--	150
CHLOROFORM	--	0.01	0.53	0.051	0.051	--	0.01	0.24	--	0.24
CHROMIUM III	[h]	2	--	59,000	[i]	[h]	2	100,000	90,000	[i]
CHROMIUM VI	--	0.05	30	0.97	0.05	--	0.05	30	0.96	0.96[f]
CHRYSENE	--	0.33	24	0.25	0.33	--	0.33	62	3.3	3.3[f]
CIS-1,2-DICHLOROETHENE	--	0.01	59	8.8	8.8	--	0.01	43	--	43
COBALT	[h]	10	--	3,100	[i]	[h]	10	4,700	3,200	[i]
COPPER	120	0.8	2,800	160	160	120	0.8	2,900	160	160
CYANIDE	--	2	1,300	0.17	2	--	2	1,200	0.17	2
DIBENZ(A,H)ANTHRACENE	--	0.33	0.061	0.00019	0.33	--	0.33	0.062	0.058	0.33
DIBENZOFURAN	--	0.33	260	13	13	--	0.33	290	--	290
DIETHYLPHTHALATE	--	0.33	52,000	650	650	--	0.33	49,000	660	660
ENDOSULFAN I	--	0.0017	3.3[j]	17	17	--	0.0017	370[j]	17	17
ENDOSULFAN II	--	0.0033	3.3[j]	15	15	--	0.0033	370[j]	15	15
ENDOSULFAN SULFATE	--	0.0033	3.3[j]	16	16	--	0.0033	370[j]	16	16
ENDRIN ALDEHYDE	--	0.0033	20[k]	2.1	2.1	--	0.0033	18[k]	17	17
ENDRIN KETONE	--	0.0033	20[k]	2.1	2.1	--	0.0033	18[k]	17	17
ETHYLBENZENE	--	0.01	2,900	230	230	--	0.01	230	--	230
FLUORANTHENE	--	0.33	2,600	160	160	--	0.33	2,300	2,000	2,000
FLUORENE	--	0.33	300	110	110	--	0.33	2,600	--	2,600
GAMMA-CHLORDANE	--	0.0017	0.34[e]	0.00076	0.0017	--	0.0017	1.6[e]	0.29	0.29[f]
HEPTACHLOR	--	0.0017	0.099	0.003	0.003	--	0.0017	0.11	0.065	0.065[f]
HEPTACHLOR EPOXIDE	--	--	0.049	0.00038	0.00038	--	0.0017	0.053	0.00038	0.0017[f]
INDENO(1,2,3-CD)PYRENE	--	0.33	0.61	0.038	0.33	--	0.33	0.62	0.35	0.35[f]
LEAD	9.0	1	400	--	220	9.0	1	400	--	220
MANGANESE	1,400	3	380	87	2,300	1,400	3	1,800	420	1,400
MERCURY	2.3	0.1	23	1.6	2.3	2.3	0.1	23	1.6	2.3
METHOXYCHLOR	--	0.017	330	26	26	--	0.017	310	280	280
MOLYBDENUM	2.7	1.0	380	47	47	2.7	1.0	390	79	79
N-NITROSO-DI-N-PROPYLAMINE	--	0.33	0.063	0.00017	0.33	--	0.33	0.069	0.00017	0.33
N-NITROSODIPHENYLAMINE	--	0.33	91	1.1	1.1	--	0.33	99	1.1	1.1[f]
NAPHTHALENE	--	0.33	800	69	69	--	0.33	56	--	56

Attachment A
Original and Revised Parcel B Soil Cleanup Levels

	Soil concentration in milligrams per kilogram (mg/kg)					Soil concentration in milligrams per kilogram (mg/kg)				
Chemical	95 HPAL	95 Reporting limit	95 PRG, no produce	95 PRG with produce	95 Cleanup Level	99 HPAL	99 Reporting limit	99 PRG, no produce	99 PRG with produce	99 Cleanup Level
NICKEL	h	1.6	1,500	310	i	h	1.6	1,600	320	i
PENTACHLOROPHENOL	--	0.8	2.5	0.19	0.8	--	0.8	3.0	2.6	2.6
PHENANTHRENE	--	0.33	800[c]	130	130	--	0.33	22,000[l]	15,000	15,000
PHENOL	--	0.33	39,000	140	140	--	0.33	37,000	140	140
POLYCHLORINATED BIPHENYLS (PCB)[n]	--	0.016	0.066	0.00041	0.016	--	0.009	0.22	0.21	0.21
PYRENE	--	0.33	2,000	120	120	--	0.33	2,300	--	2,300
SELENIUM	2.0	1	380	140	140	2.0	1	390	140	140
SILVER	1.4	0.4	380	51	51	1.4	0.4	390	51	51
STYRENE	--	0.01	2,200	310	310	--	0.01	1,700	--	1,700
TETRACHLOROETHENE	--	0.01	7.0	0.16	0.16	--	0.01	5.7	--	0.94[b]
THALLIUM	0.81	0.4	6.1[m]	6.0	6.0	0.81	0.4	6.3[m]	6.1	6.1
TOLUENE	--	0.01	1,900	230	230	--	0.01	520	--	520
TRANS-1,2-DICHLOROETHENE	--	0.01	170	23	23	--	0.01	63	--	63
TRICHLOROETHENE	--	0.01	7.1	0.27	0.27	--	0.01	2.8	--	1.7[b]
VANADIUM	120	10	540	450	450	120	10	550	450	450
VINYL ACETATE	--	0.01	65,000	62	62	--	0.01	430	--	430
VINYL CHLORIDE	--	0.01	0.0052	0.002	0.01	--	0.01	0.022	--	0.022
XYLENE (TOTAL)	--	0.01	980	890	890	--	0.01	210	--	210
ZINC	110	4.0	23,000	370	370	110	4.0	23,000	370	370

Notes:

a PRG for cis-1,2-dichloroethene

b Cleanup value is lower than the PRG because the cleanup value is calculated using more conservative Cal/EPA slope factors, while the PRG is calculated using EPA slope factors.

c No PRG available for this compound. The PRG of naphthalene was used as a surrogate.

d No PRG available for this compound. The PRG of acenaphthene was used as a surrogate.

e No PRG available for this compound. The PRG of chlordane was used as a surrogate.

f Cleanup value is calculated using Cal/EPA slope factors.

g No PRG available for this compound. The PRG of pyrene was used as a surrogate.

h The HPAL for this metal is calculated on a sample by sample basis using a magnesium and/or cobalt regression. The new cobalt regression is found in the Nickel Screening and Implementation Plan Technical Memorandum, August 4, 1999.

i The cleanup goal is the 99 PRG with produce or the HPAL, whichever value is greater.

j No PRG available for this compound. The PRG of endosulfan was used as a surrogate.

k No PRG available for this compound. The PRG of endrin was used as a surrogate.

l No PRG available for this compound. The PRG of anthracene was used as a surrogate.

m PRG for thallium carbonate

n 1995 values are for Aroclor-1254. 1999 values are based on physical properties and toxicity values of Aroclor-1254.

-- Not available or calculated

Attachment B

Methodology for Calculation of Revised Cleanup Levels

The Parcel B cleanup values are chemical concentrations that correspond to fixed levels of risk. For Parcel B, the cleanup values represent a cancer risk of 1×10^{-6} or a hazard index of 1. The exposure pathways included in the cleanup levels are: (1) ingestion of soil, (2) dermal contact with soil, (3) inhalation of volatiles and particulates, and (4) ingestion of homegrown produce.

The cleanup values are risk-based, with two exceptions: (1) if the Hunters Point Shipyard ambient level (HPAL) exceeds the risk-based value, then the ambient value is used as the cleanup standard; or (2) if the detection limit exceeds the risk-based cleanup value, then the detection limit is used as the cleanup standard.

The equations used to calculate the cleanup levels are the same as those used to calculate the U.S. Environmental Protection Agency, Region IX (EPA) preliminary remediation goals (PRG), with the exception of the ingestion of homegrown produce pathway, which is not a pathway considered in the calculation of the EPA PRGs. The equation for the homegrown produce pathway was developed under the same methodology as the PRG-based equations used to calculate exposure for the other three pathways at Parcel B. The equations backcalculate a soil concentration from a target risk (for carcinogens) or hazard quotient (for noncarcinogens). The equations simultaneously combine risks from ingestion, dermal contact, inhalation, and ingestion of homegrown produce.

For carcinogenic contaminants, carcinogenic risks during the first 30 years of life were calculated using age-adjusted factors (adj). These factors approximate the integrated exposure from birth until age 30 combining contact rates, body weights, and exposure durations for two groups – small children and adults. All exposure parameters used in the following equations are presented in Tables B-1 and B-2. The age-adjusted factors for the four pathways (ingestion, dermal contact, inhalation, and ingestion of homegrown produce) were calculated as follows:

(1) ingestion ([mg-yr]/[kg-d]:

$$IFS_{adj} = \frac{ED_c \times IRS_c}{BW_c} + \frac{(ED_r - ED_c) \times IRS_a}{BW_a}$$

(2) skin contact ([mg-yr]/[kg-d]:

$$SFS_{adj} = \frac{ED_c \ x \ AF_c \ x \ SA_c}{BW_c} + \frac{(ED_r - ED_c) \ x \ AF_a \ x \ SA_a}{BW_a}$$

(3) inhalation ([m^3-yr]/[kg-d]):

$$InhF_{adj} = \frac{ED_c \ x \ IRA_c}{BW_c} + \frac{(ED_r - ED_c) \ x \ IRA_a}{BW_a}$$

(4) produce ingestion ([g-yr]/[kg-d]):

$$Prod_{adj} = \frac{ED_c \ x \ IPR_c}{BW_c} + \frac{(ED_r - ED_c) \ x \ IPR_a}{BW_a}$$

The equation for exposure to carcinogenic contaminants utilizes the above age-adjusted factors and is as follows:

Combined Exposures to Carcinogenic Contaminants in Residential Soil

$$C(mg/kg) = \frac{TR \ x \ AT_c}{EF_r \left[\left(\frac{IFS_{adj} \ x \ CSF_o}{10^6 \ mg/kg} \right) + \left(\frac{SFS_{adj} \ x \ ABS \ x \ CSF_o}{10^6 \ mg/kg} \right) + \left(\frac{InhF_{adj} \ x \ CSF_i}{VF \ or \ PEF} + \left(\frac{Prod_{adj} \ x \ UF \ x \ CSF_o}{10^3 \ g/kg} \right) \right) \right]}$$

Noncarcinogenic contaminants are evaluated in children separately from adults. No age-adjustment factor is used in this case.

Combined Exposures to Noncarcinogenic Contaminants in Residential Soil

$$C(mg/kg) = \frac{THQ \ x \ BW_c \ x \ AT_n}{EF_r \ x \ ED_c \left[\left(\frac{1}{RfD_o} x \frac{IRS_c}{10^6 \ mg/kg} \right) + \left(\frac{1}{RfD_o} x \frac{SA_c \ x \ AF \ x \ ABS}{10^6 \ mg/kg} \right) + \left(\frac{1}{RfD_i} x \frac{IRA_c}{VF \ or \ PEF} \right) + \left(\frac{1}{RfDo_i} x \frac{IPR_c \ x \ UF}{10^3 g/kg} \right) \right]}$$

The original ROD cleanup values were calculated based on the toxicity values and exposure parameters used in the Parcel B risk assessment, which were prepared consistent with EPA guidance in 1995. The revised cleanup values are based on current exposure parameters and toxicity values recommended by EPA in their 1999 PRGs (EPA 1999). The following sections summarize the new information from EPA used in calculation of the revised cleanup levels.

Dermal Exposure Parameters

Since the calculation of the original ROD cleanup goals, EPA has revised its recommended approach in assessing the dermal exposure pathway. The soil adherence factors, skin surface areas, and chemical-specific absorption factors used in the calculation of the 1999 PRGs were used in revising the cleanup values. The revised dermal exposure parameters are presented in Table B-1.

Toxicity Values

Toxicity values used in the calculation of the cleanup values were obtained from the EPA PRG table (EPA 1999) and the Cal/EPA cancer potency factors table (Cal/EPA 1994). Generally, the Cal/EPA values were more conservative than the values listed on the PRG table. For chemicals with more than one available slope factor, the maximum slope factor was used in the calculations, with the exception of PCBs, for which the EPA value was used.

The following chemicals were detected at Parcel B but do not have published toxicity values: 2-methylnaphthalene, acenaphthylene, alpha chlordane, gamma-chlordane, benzo(g,h,i)perylene, endosulfan I, endosulfan II, endosulfan sulfate, endrin aldehyde, endrin ketone, and phenanthrene. The acenaphthene reference doses (RfD) were used to evaluate acenaphthylene. The chlordane slope factors (SF) and RfDs were used to evaluate alpha-chlordane and gamma-chlordane. The pyrene RfDs were used to evaluate benzo(g,h,i)perylene. The endosulfan RfDs were used to evaluate endosulfan I, endosulfan II, and endosulfan sulfate. The endrin RfDs were used to evaluate endrin aldehyde and endrin ketone. The anthracene RfDs were used to evaluate phenanthrene.

The toxicity values for all chemicals used in the calculation of the cleanup values are presented in Table B-2.

Ingestion of Homegrown Produce

Previously, residential exposure of homegrown produce was evaluated based on chemical concentrations in soil and soil-to-plant uptake factors (UF). The mechanism of uptake evaluated was the root uptake of chemicals from soil and translocation of chemicals to edible plant parts. However, recent EPA guidance recommends using a correction factor to reduce the estimated produce concentration for lipophilic chemicals (those chemicals with a log K_{ow} greater than 4)

(EPA 1994a, 1998). Lipophilic chemicals detected at Parcel B include polychlorinated biphenyls (PCB), polynuclear aromatic hydrocarbons (PAH), pesticides, and semivolatile organic compounds (SVOC). Therefore, in accordance with EPA guidance, chemical-specific UFs were adjusted using the correction factor of 0.01 for those chemicals with a log K_{ow} greater than 4.

In addition, risks associated with volatile organic compounds (VOC) were not evaluated in calculation of the revised cleanup values. VOCs are typically low-molecular-weight chemicals that do not persist or bioaccumulate in the environment (EPA 1994b). Because VOCs are typically lost from surface soil through volatilization, soil concentrations measured during site investigation studies will not be representative of concentrations over a 30-year period, which is the exposure duration assumed in calculation of the cleanup values. Furthermore, VOCs are expected to be lost during soil tilling, planting, and food preparation activities such as peeling, cooking, and cleaning.

Although the toxicity values and other chemical-specific parameters listed in Table B-2 are listed to two significant figures, the actual values used in calculation of the cleanup levels were obtained from the downloadable version of the PRG table obtained from EPA's web site at *http://www.epa.gov/region09/waste/sfund/prg/r9prgtable.xls*, which do not round the values to two significant figures. As a result, recalculation of the cleanup values using the equations and parameters listed in this attachment may not exactly match the values listed in Attachment A.

References

California Environmental Protection Agency (Cal/EPA). 1994. Memorandum Regarding Cancer Potency Factors: Update. From Standards and Criteria Work Group, Office of Environmental Health Hazard Assessment (OEHHA). To Cal/EPA Departments, Boards, and Office. November 1.

PRC Environmental Management, Inc. (PRC). 1996. "Parcel B Remedial Investigation Draft Final Report, Hunters Point Shipyard, San Francisco, California." Volume X, Appendix N.

United States Environmental Protection Agency (EPA). 1994a. "Estimating Exposure to Dioxin-Like Compounds, Volume I, Executive Summary." Office of Health and Environmental Assessment, Exposure Assessment Group. EPA/600/6-88/005Ca. June.

EPA 1994b. "Revised Draft Guidance for Performing Screening Level Risk Analyses at Combustion Facilities Burning Hazardous Wastes, Attachment C, Draft Exposure Assessment Guidance for RCRA Hazardous Wastes."

EPA. 1998. "Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volume I." Office of Solid Waste and Emergency Response. EPA/530/D-98/001A. July.

EPA. 1999. "Region IX Preliminary Remediation Goals (PRGs) 1999." October 1.

Table B-1: Exposure Parameters used in Calculating Revised Cleanup Levels

Symbol	Definition (units)	Value	Reference
CSF_o	Oral cancer slope factor $(mg/kg\text{-}d)^{-1}$	Chemical-specific	EPA 1999, Cal/EPA 1994
CSF_i	Inhalation cancer slope factor $(mg/kg\text{-}d)^{-1}$	Chemical-specific	EPA 1999, Cal/EPA 1994
RfD_o	Oral reference dose (mg/kg-d)	Chemical-specific	EPA 1999
RfD_i	Inhalation reference dose (mg/kg-d)	Chemical-specific	EPA 1999
TR	Target cancer risk	1×10^{-6}	--
THQ	Target hazard quotient	1	--
BW_a	Body weight, adult	70 kg	EPA 1999
BW_c	Body weight, child	15 kg	EPA 1999
AT_c	Averaging time, carcinogens	25,550 days	EPA 1999
AT_n	Averaging time, noncarcinogens	$365 \times ED$	EPA 1999
SA_a	Dermal surface area, adult (cm^2/d)	5,700	EPA 1999
SA_c	Dermal surface area, child (cm^2/d)	2,800	EPA 1999
AF_a	Soil adherence factor, adult (mg/cm^2)	0.07	EPA 1999
AF_c	Soil adherence factor, child (mg/cm^2)	0.2	EPA 1999
ABS	Skin absorption factor (unitless)	Chemical-specific	EPA 1999
IRA_a	Inhalation rate, adult (m^3/d)	20	EPA 1999
IRA_c	Inhalation rate, child (m^3/d)	10	EPA 1999
IRS_a	Soil ingestion rate, adult (mg/d)	100	EPA 1999
IRS_c	Soil ingestion rate, child (mg/d)	200	EPA 1999
IPR_a	Produce ingestion rate, adult (g/d)	122	PRC 1996
IPR_c	Produce ingestion rate, child (g/d)	79	PRC 1996
EF_r	Exposure frequency (d/y)	350	EPA 1999
ED_r	Exposure duration, resident (years)	30	EPA 1999
ED_c	Exposure duration, child (years)	6	EPA 1999
	Age-adjusted factors for carcinogens:		
IFS_{adj}	Soil ingestion factor ([mg-y]/[kg-d])	114	EPA 1999
SFS_{adj}	Dermal factor ([mg-y]/[kg-d])	361	EPA 1999
$InhF_{adj}$	Inhalation factor ($[m^3\text{-}y]/[kg\text{-}d]$)	11	EPA 1999
$Prod_{adj}$	Produce factor ([g-y]/kg-d])	73	By analogy to EPA 1999
PEF	Particulate emission factor (m^3/kg)	1.316×10^9	EPA 1999
VF	Volatilization factor (m^3/kg)	Chemical-specific	EPA 1999
UF	Produce uptake factor	Chemical-specific	EPA 1994a, 1998

Table B-2: Chemical-Specific Values Used in Calculation of Cleanup Levels

COPC	CSFo (mg/kg-d)$^{-1}$	CSFi (mg/kg-d)$^{-1}$	RfDo (mg/kg-d)	RfDi (mg/kg-d)	K_{ow}	Uptake Factor (UF)	ABS (unitless)	VF or PEF (m^3/kg)
Metals								
Aluminum	--	--	1.0E+00	1.4E-03	--	1.1E-04	--	1.316E+09
Antimony	--	--	4.0E-04	--	--	5.2E-03	--	1.316E+09
Arsenic	1.5E+00	1.5E+01	3.0E-04	--	--	1.0E-03	0.03	1.316E+09
Barium	--	--	7.0E-02	1.4E-04	--	2.6E-03	--	1.316E+09
Beryllium	--	8.4E+00	2.0E-03	5.7E-06	--	2.6E-04	--	1.316E+09
Cadmium	--	1.5E+01	5.0E-04	--	--	2.6E-02	0.001	1.316E+09
Chromium III	--	--	1.5E+00	--	--	7.8E-04	--	1.316E+09
Chromium VI	4.2E-01	5.1E+02	3.0E-03	--	--	7.8E-04	--	1.316E+09
Cobalt	--	--	6.0E-02	--	--	1.2E-03	--	1.316E+09
Copper	--	--	3.7E-02	--	--	4.4E-02	--	1.316E+09
Manganese	--	--	2.4E-02	1.4E-05	--	8.7E-03	--	1.316E+09
Mercury	--	--	3.0E-04	8.6E-05	--	3.5E-02	--	1.316E+09
Molybdenum	--	--	5.0E-03	--	--	1.0E-02	--	1.316E+09
Nickel	--	9.1E-01	2.0E-02	--	--	1.0E-02	--	1.316E+09
Selenium	--	--	5.0E-03	--	--	4.4E-03	--	1.316E+09
Silver	--	--	5.0E-03	--	--	1.7E-02	--	1.316E+09
Thallium	--	--	8.0E-05	--	--	7.0E-05	--	1.316E+09
Vanadium	--	--	7.0E-03	--	--	5.2E-04	--	1.316E+09
Zinc	--	--	3.0E-01	--	--	1.6E-01	--	1.316E+09
Volatile Organic Compounds								
Benzene	1.0E-01	1.0E-01	3.0E-03	1.7E-03	--	--	--	2.8E+03
Bromoform	7.9E-03	3.9E-03	2.0E-02	2.0E-02	2.5E+02	2.5E-01	0.10	1.316E+09
Carbon disulfide	--	--	1.0E-01	2.0E-01	--	--	--	1.2E+03
Carbon tetrachloride	1.5E-01	1.5E-01	7.0E-04	7.0E-04	--	--	--	2.0E+03
2-Butanone (methyl ethyl ketone)	--	--	6.0E-01	2.9E-01	--	--	--	1.9E+04
Chlorobenzene	--	--	2.0E-02	1.7E-02	--	--	--	6.3E+03
Chloroform	3.1E-02	8.1E-02	1.0E-02	8.6E-05	--	--	--	2.9E+03
1,2-Dichloroethane	9.1E-02	9.1E-02	3.0E-02	1.4E-03	--	--	--	4.9E+03

Table B-2: Chemical-Specific Values Used in Calculation of Cleanup Levels

COPC	CSFo (mg/kg-d)$^{-1}$	CSFi (mg/kg-d)$^{-1}$	RfDo (mg/kg-d)	RfDi (mg/kg-d)	K_{ow}	Uptake Factor (UF)	ABS (unitless)	VF or PEF (m^3/kg)
1,1-Dichloroethene	6.0E-01	1.8E-01	9.0E-03	9.0E-03	--	--	--	1.5E+03
1,2-Dichloroethene (total)	--	--	1.0E-02	1.0E-02	--	--	--	2.9E+03
1,2-Dichloroethene (cis)	--	--	1.0E-02	1.0E-02	--	--	--	2.9E+03
1,2-Dichloroethene (trans)	--	--	2.0E-02	2.0E-02	--	--	--	2.1E+03
Ethylbenzene	--	--	1.0E-01	2.9E-01	--	--	--	4.2E+03
4-Methyl-2-pentanone (methyl isobutyl ketone)	--	--	8.0E-02	2.3E-02	--	--	--	2.5E+04
Styrene	--	--	2.0E-01	2.9E-01	--	--	--	1.5E+04
Tetrachloroethene	5.2E-02	2.1E-02	1.0E-02	1.1E-01	--	--	--	3.2E+03
Toluene	--	--	2.0E-01	1.1E-01	--	--	--	3.6E+03
1,1,1-Trichloroethane	--	--	3.5E-02	2.9E-01	--	--	--	2.4E+03
1,1,2-Trichloroethane	5.7E-02	5.6E-02	4.0E-03	4.0E-03	--	--	--	7.6E+03
Trichloroethene	1.5E-02	1.0E-02	--	6.0E-03	--	--	--	2.6E+03
Vinyl acetate	--	--	1.0E+00	5.7E-02	--	--	--	4.8E+03
Vinyl chloride	1.9E+00	3.0E-01	--	--	--	--	--	1.0E+03
Xylene (total)	--	--	2.0E+00	2.0E-01	--	--	--	4.4E+03
Semivolatile Organic Compounds								
Acenaphthylene	--	--	6.0E-02	6.0E-02	--	--	--	1.8E+05
Acenaphthene	--	--	6.0E-02	6.0E-02	--	--	--	1.8E+05
Anthracene	--	--	3.0E-01	3.0E-01	--	--	--	7.0E+05
Benzo(a)anthracene	1.2E+00	3.9E-01	--	--	4.0E+05	4.5E-05	0.13	1.316E+09
Benzo(a)pyrene	1.2E+01	3.9E+00	--	--	1.2E+06	2.5E-05	0.13	1.316E+09
Benzo(b)fluoranthene	1.2E+00	3.9E-01	--	--	1.2E+06	2.5E-04	0.13	1.316E+09
Benzo(k)fluoranthene	1.2E+00	3.9E-01	--	--	1.2E+06	2.5E-04	0.13	1.316E+09
Benzo(g,h,i)perylene	--	--	3.0E-02	3.0E-02	3.2E+06	1.9E-04	0.13	1.316E+09
Benzoic acid	--	--	4.0E+00	4.0E+00	7.4E+01	3.6E-01	0.10	1.316E+09
Bis(2-ethylhexyl)phthalate	1.4E-02	1.4E-02	--	--	9.5E+03	6.0E-04	0.10	1.316E+09
Carbazole	2.0E-02	2.0E-02	--	--	3.9E+03	7.6E-02	0.10	1.316E+09
Chrysene	1.2E-01	3.9E-02	--	--	4.1E+05	3.1E-04	0.13	1.316E+09
Dibenzo(a,h)anthracene	7.3E+00	4.1E+00	--	--	6.3E+06	1.6E-04	0.13	1.316E+09

Table B-2: Chemical-Specific Values Used in Calculation of Cleanup Levels

COPC	CSFo $(mg/kg\text{-}d)^{-1}$	CSFi $(mg/kg\text{-}d)^{-1}$	RfDo (mg/kg-d)	RfDi (mg/kg-d)	K_{ow}	Uptake Factor (UF)	ABS (unitless)	VF or PEF (m^3/kg)
Dibenzofuran	--	--	4.0E-03	4.0E-03	--	--	--	6.5E+05
1,2-Dichorobenzene	--	--	9.0E-02	5.7E-02	--	--	--	1.2E+04
1,4-Dichlorobenzene	4.0E-02	4.0E-02	3.0E-02	3.0E-02	--	--	--	1.3E+04
Diethylphthalate	--	--	8.0E-01	8.0E-01	3.2E+02	2.4E-01	0.10	1.316E+09
2,4-Dimethylphenol	--	--	2.0E-02	2.0E-02	2.6E+02	1.4E-01	0.10	1.316E+09
Fluoranthene	--	--	4.0E-02	4.0E-02	7.9E+04	4.7E-04	0.13	1.316E+09
Fluorene	--	--	4.0E-02	4.0E-02	--	--	--	2.7E+05
Indeno(1,2,3-cd)pyrene	1.2E+00	3.9E-01	--	--	3.2E+06	1.9E-04	0.13	1.316E+09
2-Methylnaphthalene	--	--	2.0E-02	8.6E-04	--	--	--	4.3E+04
Naphthalene	--	--	2.0E-02	8.6E-04	--	--	--	4.3E+04
N-nitrosodiphenylamine	9.0E-03	9.0E-03	--	--	1.3E+03	1.0E-01	0.10	1.316E+09
N-nitrosodipropylamine	7.0E+00	7.0E+00	--	--	2.3E+01	8.2E-01	0.10	1.316E+09
Pentachlorophenol	1.2E-01	1.2E-01	3.0E-02	3.0E-02	1.0E+05	4.0E-04	0.25	1.316E+09
Phenanthrene	--	--	3.0E-01	3.0E-01	2.9E+04	5.9E-04	0.13	1.316E+09
Phenol	--	--	6.0E-01	6.0E-01	2.9E+01	8.6E-01	0.10	1.316E+09
Pyrene	--	--	3.0E-02	3.0E-02	--	--	--	3.1E+06
1,2,4-Trichlorobenzene	--	--	1.0E-02	5.7E-02	--	--	--	4.2E+04
Pesticides/PCBs								
Aldrin	1.7E+01	1.7E+01	3.0E-05	3.0E-05	2.0E+05	3.8E-04	0.10	1.316E+09
alpha-Chlordane	1.2E+00	1.2E+00	5.0E-04	2.0E-04	21E+03	8.3E-04	0.04	1.316E+09
PCB[a]	2.0E+00	2.0E+00	2.0E-05	2.0E-05	1.1E+06	3.1E-03	0.14	1.316E+09
4,4'-DDD	2.4E-01	2.4E-01	--	--	1.6E+06	2.3E-04	0.03	1.316E+09
4,4'-DDE	3.4E-01	3.4E-01	--	--	1.0E+07	1.7E-04	0.03	1.316E+09
4,4'-DDT	3.4E-01	3.4E-01	5.0E-04	5.0E-04	1.6E+06	7.2E-04	0.03	1.316E+09
Endosulfan I	--	--	6.0E-03	6.0E-03	6.8E+03	6.6E-02	0.10	1.316E+09
Endosulfan II	--	--	6.0E-03	6.0E-03	4.0E+03	7.6E-02	0.10	1.316E+09
Endosulfan sulfate	--	--	6.0E-03	6.0E-03	4.6E+03	7.3E-02	0.10	1.316E+09
Endrin aldehyde	--	--	3.0E-04	3.0E-04	4.0E+05	2.5E-04	0.10	1.316E+09
Endrin ketone	--	--	3.0E-04	3.0E-04	4.0E+05	2.5E-04	0.10	1.316E+09

Table B-2: Chemical-Specific Values Used in Calculation of Cleanup Levels

COPC	CSFo $(mg/kg\text{-}d)^{-1}$	CSFi $(mg/kg\text{-}d)^{-1}$	RfDo (mg/kg-d)	RfDi (mg/kg-d)	K_{ow}	Uptake Factor (UF)	ABS (unitless)	VF or PEF (m^3/kg)
gamma-Chlordane	1.2E+00	1.2E+00	5.0E-04	2.0E-04	3.5E+05	1.1E-03	0.04	1.316E+09
Heptachlor	5.7E+00	5.7E+00	5.0E-04	5.0E-04	2.5E+04	6.2E-04	0.10	1.316E+09
Heptachlor epoxide	1.3E+01	1.3E+01	1.3E-05	1.3E-05	5.0E+02	2.0E-01	0.10	1.316E+09
Methoxychlor	--	--	5.0E-03	5.0E-03	8.7E+04	3.6E-04	0.10	1.316E+09
Other								
Cyanide			2.0E-02		5.6E-01	2.4E+01	0.10	1.316E+09

Notes:

a Calculated using toxicity values and physical properties of Aroclor-1254.

RESPONSE TO COMMENTS ON THE DRAFT EXPLANATION OF SIGNIFICANT DIFFERENCES FOR PARCEL B, HUNTERS POINT SHIPYARD

This document presents the U.S. Department of the Navy's (Navy) responses to comments from the regulatory agencies and other stakeholders on the April 10, 2000, draft explanation of significant differences (ESD) for Parcel B, Hunters Point Shipyard (HPS). The comments addressed below were received from the U.S. Environmental Protection Agency (EPA); California Department of Toxic Substances Control (DTSC), Human and Ecological Risk Division (HERD); the City of San Francisco (City); the technical assistance grant (TAG) contractor, Envirometrix Corporation (EMC); Arc Ecology; and Lennar BVHP Partner.

Comments are presented in boldface type.

RESPONSE TO COMMENTS FROM EPA

General Comments

1. **Comment:** **Please see enclosed red-lined version of draft ESD for EPA revisions to the text of the document.**

   Response: The Navy has incorporated all of EPA's revisions except for Section III, Changes in Nickel Ambient Values. DTSC, the regulatory agency that took the lead in the development of the nickel ambient values, requested that the Navy incorporate their revisions to Section III.

2. **Comment:** **Attachment A – please clarify units.**

   Response: Attachment A was modified to indicate that all units are in milligrams per kilogram (mg/kg).

3. **Comment:** **Attachment A – benzene. Why is cleanup level 0.18 if produce not a factor and 99 PRG is 0.67?**

   Response: The difference arises from differences in the Cal/EPA slope factors used to develop the 1999 soil cleanup level and the EPA slope factors used to develop the 1999 PRG. An explanatory footnote was added to Attachment A.

4. **Comment:** **Attachment A – 2-butanone. Please footnote that this chemical also know as methyl ethyl ketone and is identified as such in EPA's PRG tables.**

   Response: Attachments A and B have been modified to indicate that 2-butanone is synonymous with methyl ethyl ketone.

5. **Comment:** **Attachment A – lead. It is EPA's understanding that the reduction of the lead cleanup value to 220 mg/kg from 400 mg/kg is due to produce uptake. Please add 220 to the 99 PRG with produce column.**

Response: The lead cleanup concentration of 220 mg/kg is not calculated in the same manner as the other chemicals at Parcel B. The cleanup level of 220 mg/kg was calculated using EPA's "Integrated Uptake Biokinetic Model for Lead in Children" (IEUBK) (EPA 1994). This model estimates blood lead concentrations based on estimates of the total lead uptake for children from exposure pathways such as inhalation, diet, soil and dust ingestion, and maternal exposure. The 220 mg/kg cleanup level corresponds to a blood lead level in children of 10 micrograms per deciliter of blood, EPA's threshold blood lead level. Text was not changed in response to this comment.

6. **Comment:** **Attachment A – after reviewing this table, I have concerns about the cleanup numbers that default to detection limits (DL) that are clearly outside the risk range or present a non-cancer risk (Hazard Index) greater than 1. For example, n-nitroso-di-n-propylamine where the 99 PRG is .069, the PRG with produce is 0.00017 but the cleanup number is 0.33 based on the DL. As the BCT discussed many times in the past, it is possible to get lower detection limits and the Navy has agreed to try to reach these lower detection limits. In this case where cleanup to the DL clearly results in risks in excess of the risk range the Navy should continue to try to reach the lower DL. Also, the Navy should explain why the DL has resulted in the default cleanup for several chemicals perhaps in a footnote.**

Response: Four chemicals listed in Attachment A default to reporting limits. The Navy is committed to reaching appropriate reporting limits as discussed below.

<u>FOR CYANIDE AND HEPTACHLOR EPOXIDE</u>:

The EPA contract laboratory procedure (CLP) report limits for cyanide and heptachlor epoxide are 2 and 0.0017 mg/kg, respectively. The CLP methods are widely used and provide the level of confidence in data quality necessary for the confirmation sampling. Cyanide was a target analyte for only one excavation; heptachlor epoxide was not a target analyte for any excavations in Parcel B.

<u>FOR DIBENZ(A,H)ANTHRACENE AND N-NITROSO-DI-N-PROPYLAMINE :</u>

These are both semivolatile compounds; dibenz(a,h)anthracene is a polynuclear aromatic hydrocarbon (PAH). The CLP report limit for both of these semivolatiles is 0.33 mg/kg. Confirmation samples were analyzed by a modified method with a report limit of 0.16 mg/kg (before correction for percent solids) in order to ensure sure that the 0.33 mg/kg goal was met. The gas chromatography/ mass spectrometry (GC/MS) method used is a powerful method, and the laboratory could and would report results lower than the report limit if they were detected. The method detection limits (MDL) at STL-VT laboratory (which performed all the confirmation analyses) are 0.032 and 0.038 mg/kg for N-nitroso-di-n-propylamine and dibenz(a,h)anthracene, respectively, which is approximately 10 times less than the 0.33 mg/kg ROD goal.

N-nitroso-di-n-propylamine was a target analyte for only one Parcel B remedial action excavation; all results were nondetect.

7. **Comment:** **Attachment A. Footnote "a" – soil saturation. According to EPA's Dr. Daniel Stralka, if the soil saturation value is less than the 99 PRG, then the cleanup value should be the soil saturation value. Conversely, the Navy should use the PRG when the soil saturation is greater than the 99 PRG. Only four COPCs in Attachment A are impacted: 1,2-dichlorobezene, ethylbenzene, styrene, and toluene. Add text to footnote clarifying why soil saturation is a factor in determining the cleanup value for some COPCs. Please direct any questions on this comment to Dr. Stralka 415-744-2310.**

Response: The soil cleanup levels for 1,2-dichlorbenzene, ethylbenzene, styrene, toluene, and xylene have been changed to the soil saturation limits as presented in the 1999 PRG table. The footnote was removed from the table.

8. **Comment:** **Attachment A of the ESD indicates that the revised cleanup goal for total xylenes is 1400 mg/kg. Total xylenes should have been footnoted with footnote "a" and based on comment 6 above, the cleanup number for total xylenes should be the soil saturation level of 210 mg/kg, as presented in the U.S. EPA Region IX PRGs.**

Response: Please see the response to comment 7 above.

9. **Comment:** **In ESD Attachment B, discussion of ingestion of homegrown produce should include an explanation for why the calculation for lipophilic compound uptake has changed since 1995. Basically, the initial model was based on root hair uptake. More recent reports, referenced in the documents listed, look at translocation into and through the plant and found that the actual uptake is much reduced for these fat soluble compounds. The original model is based on contaminant uptake from a liquid growth medium into barley roots. The model corrected for the difference from water to soil by incorporating the chemical specific soil/water partitioning coefficient. Subsequent research on crops in the Serveso area of Italy that was contaminated with dioxin from an industrial accident measured plant uptake of dioxin into carrots and found it to be much lower than predicted by the model and not translocated throughout the plant as is assumed in the model. The dioxin is primarily bound to the skin and not translocated through out the plant. Therefore, the model was refined for lipophilic compounds that only 1% of the soil concentration will be incorporated into and consumed from root crops.**

Response: For purposes of brevity, a detailed explanation for the adjustment to the produce uptake factor was not included in Attachment B. The Navy acknowledges comment 9, and additional information is available in EPA's "Estimating Exposure to Dioxin-Like Compounds, Volume I" and "Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volume I" cited in Attachment B.

10. **Comment:** **Table B-2. Table B-2 of the ESD (Chemical-Specific Values Used in Calculation of Cleanup Levels) includes freon 113, methyl ethyl ketone, and methyl isobutyl ketone, however, these COPCs are absent from Attachment A.**

Response: Freon 113 was not detected in soil at Parcel B and all reference to Freon 113 was removed from Attachment B. Methyl ethyl ketone and methyl isobutyl ketone are included in Attachment A as 2-butanone and 4-methyl-2-pentanone, respectively. Attachments A and B have been modified to indicate that the compounds are synonymous.

11. **Comment:** **Table B-2. In several cases, it appears that the toxicity information that is presented in Table B-2 of the ESD (the cancer slope and reference dose values) is not the most recent data. However, these errors did not impact the cleanup levels presented in Attachment A, possibly because the incorrect toxicity information likely was not used in the calculation of the revised cleanup goals. For example, while the cancer slope values for benzene are not correct, the reference dose values for benzene are correct, and since these values are more conservative than the cancer slope values, the Navy used these values to calculate the revised cleanup goal for benzene. The Navy should check all of the values presented in Table B-2 to ensure that this table reflects the most recent cancer slope and reference dose values.**

Response: The toxicity information presented in Table B-2 of the ESD is the most recent data available. The reference doses in Table B-2 were obtained from EPA's Integrated Risk Information System (IRIS). The slope factors were obtained from IRIS and from Cal/EPA (1994). In cases where both EPA and Cal/EPA slope factors are available for a chemical, the higher of the two (more conservative) were used in calculating the cleanup levels, with the exception of polychlorinated biphenyls (PCBs), where the EPA value was used..

In the case of benzene, the slope factors presented in Table B-2 are the Cal/EPA slope factors, which are different from the EPA slope factors; the cleanup level is based on the Cal/EPA values. All toxicity values in Table B-2 have been reviewed in response to this comment and are accurate.

12. **Comment:** **EPA and its contractor are continuing to check the calculations for the cleanup goals impacted by produce and presented in Attachment A. We should have the results by the end of the week. (Note: all calculations checked to date have been accurate and the corresponding Attachment A 99 cleanup level correct.)**

Response: It is the Navy's understanding that the calculations for the cleanup goals have been reviewed for accuracy by both EPA and Cal/EPA and have been found acceptable, as stated at the BCT meeting on April 27, 2000.

13. Comment: **Attachment A – there are three different cleanup values for Aroclors 1242, 1254 and 1260, once produce uptake is factored in. The EPA 99 PRG for Aroclors 1242, 1254 and 1260 is 0.22. EPA's Dr. Daniel Stralka contacted Tetra Tech to discuss the apparent discrepancies in the Aroclor produce calculation. We are continuing to review this data and work with Tetra Tech to determine the appropriate physical properties to be used in the calculations. We will get back to the Navy with this information by May 1, 2000. Please direct any questions on this comment to Dr. Stralka at 415-774-2310.**

Response: The cleanup values for the three Aroclor mixtures detected in soil at Parcel B have been revised in response to this comment. The soil cleanup value calculations in the April 10, 2000 ESD used the same physical properties as the Parcel B Remedial Investigation (RI) and ROD to maintain consistency among the documents. Each of the three Aroclor mixtures detected in soil at Parcel B is a different mixture of PCB congeners, with slightly different physical properties that produce slightly different cleanup values. Conversely, a reference dose is available only for Aroclor-1254. The revised soil cleanup levels for all three Aroclor mixtures incorporate physical property values for Aroclor-1254, as recommended by Dr. Daniel Stralka of EPA, as a conservative approach. The revised approach consistently uses the chemical and toxicological properties of Aroclor-1254 as surrogates for Aroclor-1242 and Aroclor-1260. Attachment A was revised to reflect the revised soil cleanup values for the Aroclors. The Aroclors have been replaced in Attachments A and B with 'Polychlorinated Biphenyls.' The soil cleanup value for PCBs will be used to evaluate all PCBs detected at Parcel B.

RESPONSE TO COMMENTS FROM DTSC, HERD (JAMES M. POLISINI, Ph.D)

General Comment

1. Comment: **HERD supports the use of better and more recent scientific estimates of exposure and toxicity. We have no generic objection to review and revision of the Parcel B Soil Cleanup Goals (SCLs) which were originally based on 1995 data as long as the changes are justified and can be completely reviewed.**

Response: The Navy acknowledges this comment. It is the Navy's understanding that the soil cleanup goals have been reviewed and accepted by HERD.

Specific Comments

1. Comment: **HERD does not categorically agree to the limitations placed on the fact that the cleanup values will be health-based (Attachment B, page 1 of 10). We agree with the first criterion that cleanup concentrations can be placed at an 'ambient' concentration for inorganic elements if the risk-based concentration is below the unimpacted 'ambient' concentration. We cannot categorically agree that if detection limits exceed the risk-based concentration, that detection limits become the *de facto* cleanup concentration. This would require a chemical by chemical assessment of the concentration of the elevated detection limit and the risk or hazard associated with each elevated detection limit.**

   Response: The Navy concurs that a chemical-by-chemical evaluation is appropriate. Please see the response to EPA comment 6 (above) regarding reporting limits.

2. Comment: **The indoor exposure pathway should be included for evaluation for any sites in Parcel B with detected concentrations of Volatile Organic Compound (VOCs) in shallow groundwater (Attachment B, page 2 of 10). HERD recommends use of the U.S. EPA Johnson and Ettinger model released in 1999 for evaluation of the indoor air pathway for VOCs. HERD can supply this model or it can be downloaded from the U.S. EPA Superfund web site.**

   Response: The indoor air pathway was evaluated in the Parcel RI and is not within the scope of the ESD as agreed to by the BCT on March 30, 2000.

3. Comment: **Please provide a complete table listing the exposure parameters and the subgrouping of parameters for children and adults, which are presented in the intake equations beginning on page 1 of 10. These can be supplied in a single table so as not to confuse the text section of Attachment B.**

   Response: Page 1 of Attachment B was revised to indicate that all exposure parameters used in calculation of the soil cleanup values are presented in Table B-1.

4. Comment: **HERD agrees that the 2.0 $(mg/kg\text{-}day)^{-1}$ cancer slope factor may be used (Attachment B, Toxicity Values, page 3 of 10) for polychlorinated biphenyls (PCBs) for calculation of Soil Cleanup Levels (SCLs) at Hunters Point Shipyard Parcel B.**

   Response: The Navy concurs with this comment.

5. Comment: **The methodology section (Attachment B, page 2 of 10) states that the revised cleanup values area based on the toxicity values currently recommended in the U.S. EPA Region 9 Preliminary Remediation Goal (PRG) tables. The discussion of the toxicity values used indicates that CalEPA cancer potency factors were used where the CalEPA value was more conservative than the EPA PRG table value (Attachment B, Toxicity**

Values, page 3 of 10). The comparative table for 1995-based and 1999-based SCLs (Attachment A) only lists 3 SCLs with a footnote of 'c' indicating that the CalEPA cancer potency factor was used. There are more than 3 carcinogenic chemicals for which the CalEPA cancer potency factor is more conservative than that used by the U.S. EPA. A full set of spreadsheet calculations were not presented for review. However, It appears from examination of Attachment A and comparison with the 'Cal-modified' values contained in the U.S. EPA Region 9 PRG table, that the 'Cal-modified' values are not even presented in the cases where the detection limit exceeds the U.S. EPA Region 9 PRG-based calculation. Please provide more detail in the methodology section to fully describe the sequence of steps for development of the proposed SCLs. If the hypothesis regarding detection limits explains the paucity of SCLs based on CalEPA cancer potency factors please state that basis clearly in the text of the methodology (Attachment B).

Response: Attachment A was modified to identify the chemicals for which Cal/EPA slope factors were used to calculate the soil cleanup values. The spreadsheets used to calculate the soil cleanup values have been forwarded to DTSC for review.

Regarding detection limits, please see the response to EPA comment 6 (above).

6. **Comment:** **The accuracy of the SCLs based on the 1999 U.S. EPA PRG values (Attachment A) cannot be fully reviewed as the SCLs are presented as a single worksheet without the associated worksheets in which the arithmetic calculations are performed. The physical parameters and toxicity values are presented (Attachment B, Table B-2). However, the actual worksheets should be furnished as part of a complete workbook. For example, without the full spreadsheet calculations to show specifically how log K_{OW} values entered into the determination of the reduction in the homegrown produce concentration due to low water solubility (Ingestion of Homegrown Produce, page 3 of 10) cannot be easily verified without the spreadsheet calculations. One specific example of this difficulty is the differing SCLs for Aroclors 1242 through 1260 (Attachment A). The proposed SCLs differ by an approximate factor of 2. We are unaware of any differences in log K_{OW} values for different Aroclors in the U.S. EPA Region 9 PRG tables. Without specific statement of the log K_{OW} and references we cannot fully review these values.**

Response: Attachment B was modified to more fully document the soil cleanup value development, including presentation of all equations and values used for equation variables. The spreadsheets used to calculate the soil cleanup values have been forwarded to DTSC for review. Regarding the cleanup values for the Aroclor compounds, please see the response to EPA comment 13 (above).

7. **Comment:** **The non-cancer reference doses (Attachment B, Table B-2) were checked at random and found to agree with the values in the 1999 U.S. EPA Region 9 PRG table. The cancer slope factors (Attachment B, Table B-2) were checked at random and found to agree with the most protective of the U.S.**

EPA Region 9 cancer slope factors or the three cancer potency factors from the Office of Environmental Health Hazard Assessment (OEHHA) as noted in Specific Comment number 5.

Response: The Navy acknowledges this comment.

Conclusions

1. **Comment:** **The portions of the proposed Soil Cleanup Levels (SCLs) we were able to check appear acceptable for the most part. There are some portions we were not easily able to verify because of lack of references and submittal of text tables rather than complete worksheets.**

   Evaluation of the indoor air exposure pathway for VOCs should be performed for any sites within Parcel B with shallow VOC contamination of groundwater.

   Response: Please refer to DTSC comments 6 and 2 above, respectively.

RESPONSE TO COMMENTS FROM THE CITY OF SAN FRANCISCO

General Comments

1. **Comment:** **I have been reviewing the Parcel B ESD, in particular Attachment A. I haven't checked the numbers on Attachment A (hoping EPA is doing that?) but assuming the numbers are correct, I think you did a good job in making it very clear this time how you picked each cleanup value, the shading really helps.**

   Response: Please see response to EPA comment 12 (above) regarding cleanup goal calculations.

2. **Comment:** **I'm having trouble with footnote "a". Is soil saturation an issue with the PRG calculations only for these compounds? And why do you then calculate a different risk based number for your cleanup value? Why wouldn't you just use the PRG? I think the answer to these questions needs to be incorporated into the footnote.**

   Response: Please see response to EPA comment 7 (above) regarding saturation limits.

3. **Comment:** **For footnotes "h" and "i", I suggest that instead of putting two dashes with the footnote next to them ("--h") that you instead just put the "h" or the "i" in the box. The two dashes implies that there is no value, so it is not until you read the footnote that you realize there is a value. The text for footnote "h" should read:**

h The HPAL for this metal is calculated using a magnesium and/or cobalt regression. Please refer to ... (refer reader to correct reports)

Response: Text was revised to reflect the proposed changes.

RESPONSE TO COMMENTS FROM ENVIROMETRIX CORPORATION

General Comments

1. Comment: **The soil cleanup goals proposed in the document have not been shown to "remain protective of human health *and the environment*" according to CERCLA. Only human health exposures were considered in developing proposed cleanup goals for the ESD. Leaching to groundwater and possible groundwater-to-surface water interactions should be considered, as well as potential exposures to aquatic species and other biota in the bay (e.g., migratory birds). The shallow depth to groundwater, coupled with the proximity of Parcel B to the San Francisco Bay, indicates that these pathways should be considered in all calculations. In some cases (especially for those chemicals that leach to groundwater over time), soil cleanup goals necessary to protect groundwater resources and the San Francisco Bay may be much lower than those calculated on the basis of human health exposure alone.**

Response: The Navy appreciates your concern in this matter. However, the purpose of the ESD is to update the Parcel B soil cleanup levels based on recent EPA guidance (revised PRGs). The new cleanup levels achieve the same level of protection to human health as those in Table 8 of the 1997, ROD. All other changes to the approach used at Hunters Point Parcel B are outside the scope of the ESD.

2. Comment: **Use of a single chemical, PRG-driven approach is inadequate for protection of human health at the Site. There are numerous chemicals at the Site, and residents and construction workers will be exposed to a range of chemicals simultaneously, not just a single chemical. Using the proposed cleanup goals and the single-chemical approach proposed in the ESD, the residual concentrations at the Site may very well exceed 1×10^{-3} risk to future residents. Not only is this unacceptable, it is outside of the accepted EPA risk range of 1×10^{-4} to 1×10^{-6} risk, and thus not in compliance with CERCLA. The Navy should provide risk evaluations that demonstrate that the *total residual risk* at the Site will not exceed 1×10^{-6}. Cleanup goals should be calculated assuming *cumulative* exposure to *all* chemicals within an exposure grid, and PRGs should be adjusted accordingly.**

Response: The Navy appreciates your concern in this matter. However, EPA guidance dictates how an ESD may be prepared. This ESD was prepared in accordance with the EPA guidance with the concurrence of the BCT on March 30, 2000. Therefore, this comment is not appropriate to this ESD.

3. **Comment:** **Although Attachment A includes proposed PRGs for VOCs, the text (Attachment B) indicates that VOCs would not be considered in goal development, since the concentration of chemicals would not likely remain constant over an 30-year duration. It is not only completely inappropriate to exclude VOCs from risk considerations and remediation at the Site, it is also a clear violation of the CERCLA mandate. It is standard risk assessment protocol to assume that the concentration of *all* chemicals, including VOCs, will be constant over a 30-year exposure period. By not following this standard approach, the Navy is essentially proposing to expose future residents to significantly higher health risk potential over time. Humans can be exposed to VOCs in soil via direct contact (dermal, ingestion), as well as via inhalation exposures (e.g., volatilization from soils to outdoor air; volatilization into future homes, and subsequent indoor air exposure). VOCs in soil can also readily leach to groundwater, and may possibly affect Bay species over time. *All pertinent exposures* should be considered *for all chemicals* when developing the proposed remedial goals.**

Response: Page 4 of Attachment B was modified to indicate that only the ingestion of homegrown produce pathway for which VOCs are not considered. Please also see the response to DTSC comment 2 (above).

4. **Comment:** **In addition to long-term residential exposure, PRGs should be established for shorter-term construction worker exposures. In some cases, PRGs may be lower for direct worker exposures during housing construction than for long-term residential exposure. The lower of the two values (residential or worker PRGs) should be used as the cleanup goal, to ensure the safety of the workers *and* the residents at the Site.**

Response: The Navy appreciates your concern in this matter. However, EPA guidance dictates how an ESD may be prepared. This ESD was prepared in accordance with the EPA guidance with the concurrence of the BCT on March 30, 2000. Therefore, this comment is not appropriate to this ESD.

5. **Comment:** **PRG development for VOCs should include long-term indoor air exposure for future homes built on the property.**

Response: The Navy appreciates your concern in this matter. However, EPA guidance dictates how an ESD may be prepared. This ESD was prepared in accordance with the EPA guidance with the concurrence of the BCT on March 30, 2000. Therefore, this comment is not appropriate to this ESD. Please also see the response to DTSC comment 2 (above).

6. Comment: **It is inappropriate to remediate Benzo(A)Pyrene (BaP) and other chemicals to their detection limit rather than to their lower, more health-protective PRGs. By doing so, the Navy is essentially proposing to leave the carcinogens BaP at 1×10^{-4} levels, heptachlor epoxide and anthracene at 1×10^{-5} levels, and n-nitroso-di-n-propylamine at 1×10^{-3} levels *(10 to 100 times the target PRGs)*; and to leave cyanide at an Hazard Index (HI) of 10 *(10 times the targeted PRG, and the agency-mandated HI of 1.0)*. Specific analytic services are available from laboratories, and enable attainment of lowered detection limits for a number of chemicals. The Navy should utilize these services so that PRG cleanup levels can be achieved at the Site.**

Response: Please see the response to EPA comment 6 (above) regarding detection limits.

7. **Comment:** **In a residential setting such as that proposed for Parcel B, it is inappropriate and unrealistic to assume that the Navy will be able to "[govern] handling of the residual contaminated soil,"[2] as proposed in the Introduction of the ESD.**

Response: The Navy is currently working with the regulatory agencies and the City of San Francisco to develop a Land Use Control Implementation Plan (LUCIP) to address this concern. The draft LUCIP will be provided for review by June 6, 2000. The Navy recommends you review that document and provide further comments on the LUCIP, as this comment is not appropriate for this ESD.

8. **Comment:** **Groundwater usage should be unlimited for this Site, especially since it will be a residential parcel. It is extremely unlikely that the Navy will be able to fully restrict future residents from using and /or contacting shallow groundwater in the future.**

Response: Please see the response to your comment 7 above.

9. **Comment:** **In future sampling, *all COPCs* should be included in the analyses, to ensure that *no* contamination above a cumulative risk of 1×10^{-6} will be left in place.**

Response: The Navy is in the process of preparing a revised sampling and analysis plan (SAP) to implement this ESD, as discussed at the March 30, 2000 scoping meeting. The draft SAP is due by May 29, 2000. The Navy will address your concern in that document, as that is not appropriate for this ESD.

10. **Comment:** **In all areas, samples should be collected to 10 feet below ground surface. This is standard protocol, and is necessary to verify the residual long-term risk to future residents.**

Response: Please see the response to your comment 9.

11. **Comment:** **Samples should be collected in a *biased* rather than random manner. The fate and transport mechanisms of each chemical, soil type, rainfall, and other data should be used to justify the sampling approach, and samples should be collected in areas of highest expected concentrations. This is necessary to ensure that all likely areas of contamination are considered in remediation, and in the evaluation of residual risk.**

Response: Please see the response to your comment 9.

12. **Comment:** **The use of composite samples can artificially "dilute" the overall detected concentration, and sometimes provide false results. For example, perhaps four samples are N.D. (or at very low concentrations) for a specific chemical, and one sample is elevated significantly above the remedial goal and /or screening level. Mixing these samples can suggest that all areas are below the remedial goal, and that no action is necessary, thus leaving excessive contamination in place. In addition, there are concerns over the total proposed sample population. Sample populations less than approximately 12-14 samples are inadequate to establish a UCL. On the basis of these concerns, it is requested that the Navy conduct discrete sampling at the Site.**

Response: Please see the response to your comment 9.

13. **Comment:** **The DTSC slope factor (SF) for PCBs should be used to develop the proposed goals if it is more health-protective that the EPA SF.**

Response: The Navy has received concurrence from DTSC on use of the EPA slope factor for PCBs. Please see the response to DTSC comment 4 (above).

14. **Comment:** **It is recognized that the Navy rounded PRGs to two significant figures. However, if there are any cases in which the PRG on the EPA's website is lower than the calculated value proposed by the Navy, the lower of the two values should always be used.**

Response: The Navy has received concurrence from DTSC and EPA on the use of two significant figures in calculating the revised soil cleanup levels.

15. **Comment:** **A number of errors occur on Attachment A, making it difficult for the public to understand the final proposed values for each chemical. For example, it is not explained on the table that the shaded area represents the proposed final cleanup goal. In addition, the HPAL for Ni, CrIII, and Co are not provided (footnote h), and it does not appear that footnotes "A" and**

"C" correspond to anything listed on the table. Further, it is unclear why where is no proposed "99 PRG with produce" for lead, implying that the proposed cleanup value is 1,400 mg/kg, rather that (no greater than) 221 mg/kg specified in Section I. Also, what are the proposed remedial goals for 1,2-DCB and 1,4-DCB, and what are the concentration units for the proposed values? This table should be revised to include all values, presented in a manner that allow the public to clearly understand the changes made between 1995 and 1999, and the values being proposed as cleanup goals. Also, please provide justification for the surrogate chemicals used when a chemical did not have a toxicity value. In addition, what are the units for the values in the Table (PPM? PPB?).

Response: Attachment A was modified to indicate that the '99 Cleanup Level' column is the soil cleanup goal. Regarding the HPAL for nickel, trivalent chromium, and cobalt, footnote 'h' indicates that the value is based on regression analysis. Regarding lead, please see the response to EPA comment 5 (above). Regarding surrogates, please see the response to Arc Ecology comment 10 (below). Attachment A was modified to indicate that all units are in mg/kg.

16. **Comment:** **Please define the terms used in Table B-2 in a footnote, for the benefit of the public.**

Response: Footnotes have been added to Table B-2 to define the terms used in the table.

17. **Comment:** **The regulatory agencies or other third party should independently verify Navy PRG calculations, to ensure that intake assumptions, toxicity values, equations, and proposed PRGs are correct.**

Response: It is the Navy's understanding that all soil cleanup values have been verified. Please see the response to EPA comment 12 (above) and DTSC comment 7 (above).

RESPONSE TO COMMENTS FROM ARC ECOLOGY

General Comment:

1. **Comment:** **We agree with the Navy's proposal to update Table 8 to reflect changes in EPA Region 9 Preliminary Remediation Goals (PRGs). I do have some questions, however, about the methods used to calculate cleanup goals from the PRGs.**

Response: The Navy acknowledges this comment. Specific comments are addressed below.

Specific Comments

1. **Comment:** **Please add units to Attachment A. I assume that the cleanup levels are reported in mg/kg.**

Response: Attachment A was modified to indicate that all units are in mg/kg.

2. Comment: **It appears from Attachment A that the Navy modified PRGs to account for produce uptake for some, but not all, chemicals of concern. Why? How was it determined whether to modify PRGs to account for produce uptake? It can be surmised from Attachment B that the Navy excluded chemicals of concern with log K_{OW} less than 4, but Table B-2 does not report K_{OW} for all chemicals of concern. Please clarify. Please add all K_{OW} values to Table B-2.**

Response: Volatile organic compounds, as defined in the EPA PRG document (EPA 1999), are the only compounds for which produce uptake was not considered. The rationale for this decision is presented on page B-4 of Attachment B. All K_{ow} values used in the calculation of soil cleanup values are presented in Table B-2 (please see response to DTSC comment 6, above).

3. Comment: **Some 1999 Cleanup Goals are based on maximum detection limits (benzo(a)pyrene, cyanide, dibenzo(a,h)anthracene, heptachlor epoxide, n-nitroso-di-n-propylamine). What EPA-approved analytical methods were used to determine these detection limits? If other, more sensitive, methods area available they should be used.**

Response: Please see the response to EPA comment 6 (above) regarding detection limits.

4. Comment: **Some 1999 Cleanup Goals were adjusted to remove Region 9's "saturation limit" from the PRG (1,2 dichlorobenzene, ethylbenzene, styrene, toluene). Wouldn't it be the case that if the cleanup goal exceeds the saturation limit than free-product would be encountered? Most of these chemicals of concern are petroleum-derived products. Doesn't California require that free-product be removed when encountered? Please provide more explanation, justification, and references.**

Response: Please see the response to EPA comment 7 (above) regarding saturation limits.

5. Comment: **What is the basis for the 1999 Cleanup goal for benzene?**

Response: Please see the response to EPA comment 11 (above) regarding use of most current scientific references and guidelines to determine the cleanup goals.

6. Comment: **What is the basis for the cleanup goal for carbon tetrachloride?**

Response: Please see the response to EPA comment 11 (above) regarding use of most current scientific references and guidelines to determine the cleanup goals

7. Comment: **Please ensure that the chemical names are consistent between Table 8 and Attachment A. For example, Table 8 refers to "methyl ethyl ketone" while Attachment A refers to the same chemical as 2-butanone. Also, "methyl**

isobutyl ketone" on table 8 is the same chemical as 4-methyl-2-pentanone on Attachment A.

Response: Please see the response to EPA comment 4 (above).

8. **Comment:** **Freon 113 appears on Table 8, but not on Attachment A.**

Response: Freon 113 was not detected in soil at Parcel B; all references to Freon 113 have been removed from Attachments A and B.

9. **Comment:** **Bis(2-ethylhexyl)phthalate appears on Attachment A but not on Table 8.**

Response: Bis(2-ethylhexyl)phthalate was not detected at Parcel B during the RI sampling and was therefore not included in Table 8. However, bis(2-ethylhexyl)phthalate was detected during soil confirmation sampling, so a cleanup value was calculated and is presented in Attachment A.

10. **Comment:** **How was it determined that anthracene is a suitable surrogate for phenanthrene? Why was the surrogate changed from naphthalene? Please explain and provide references. Please expand Attachment B to explain how and why surrogates were selected for all chemicals of concern that do not have published toxicity values.**

Response: For chemicals without published toxicity values, compounds with similar chemical structures were used as surrogates. The toxicity values for naphthalene have been revised since the ROD, so its use as a surrogate was re-evaluated. Anthracene was selected as a surrogate for phenanthrene because the size and shape of the 3-ring structure of anthracene is substantially closer to the 3-ring structure of phenanthrene than the 2-ring structure of naphthalene. Pyrene was selected as a surrogate for benzo(g,h,i)perylene for analogous structural considerations. Phenanthrene and benzo(g,h,i)perylene are the only two compounds for which the surrogates changed from those used in the ROD.

11. **Comment:** **VOCs were removed from the homegown produce risk calculations. Please provide a reference for this decision. How were VOC losses during tilling, planting, and food preparation accounted for? If indeed the VOCs are lost during these activities (presumably at a greater rate than if the soil or produce remained undisturbed) than an inhalation pathway exists and it should be evaluated.**

Response: Page 4 of Attachment B was modified to indicate that only the ingestion of homegrown produce pathway for which VOCs are not considered. Please also see the response to DTSC comment 2 (above).

RESPONSE TO COMMENTS FROM LENNAR BVHP PARTNER

General Comments

1. **Comment:** **Bullet point number 1.**

   Since there has been some discussion in the past regarding what 10^{-6} means, the Navy should clarify 10^{-6} by adding the following parenthetical language, stating "(one in one million)".

   Response: Bullet point number 1 was revised to include "one in one million".

2. **Comment:** **The first paragraph after the bullets on Page 1.**

   The Navy should clarify which specific metals have defined standard ambient levels at Hunters Point. A note should also be added to identify those metals in which background levels are based on the regression analysis and thus, are variable based on the sample location.

   Response: Attachment A indicates which metals have standard ambient values, and the footnotes to Attachment A indicate which metals are based on regression analysis.

3. **Comment:** ***Page 2, the second to last paragraph before Section III.***

   The Navy should clarify that it has additionally sampled for radionuclides at Parcel B and that either no impacts were found, or that the impacts have been remediated.

   Response: The Navy appreciates your concern in this matter. Radionuclides have been addressed in the RI. EPA guidance dictates how an ESD may be prepared. This ESD was prepared in accordance with the EPA guidance with the concurrence of the BCT on March 30, 2000. Therefore, this comment is not appropriate to this ESD.

4. **Comment:** **Section V – The Navy statement that the remedy achieves ARARS, is cost effective, and is protective of human health and the environment.**

   ***If the navy is going to make these statements,* it should also reference that it also addresses the remaining feasibility study requirements such as implementability, support agency and community acceptance, short and long term effectiveness, and reduction of toxicity, mobility, or volume through treatment. Without this statement (and the facts to support it) the reader is left to assume that these criteria have been met, or to wonder whether they may have been overlooked.**

   Response: The text was revised as follows:

"Considering the information that has been developed during implementation of the remedy and the proposed changes to the selected remedial soil cleanup goals, the Navy affirms that the updated soil cleanup goals remain protective of human health and the environment, and continue to comply with Federal and state requirements."

5. **Comment:** **Attachment B, the "Toxicity Values" section, which states, "Generally, the Cal/EPA values were more conservative that the values listed on the PRG table. For chemicals with more than one available slope factor, the maximum slope factor was used in the calculation, with the exception of PCBs, for which the EPA value was used."**

The Navy should provide an explanation for this decision or provide technical support given that this is a deviation from the approach applied to all of the other compounds. We suggest that the Navy be consistent and always use the more conservative value. If not, the Navy should provide the supporting material to clearly state why they believe the higher value is appropriate in this case.

Response: The higher or more conservative slope factors were used for every chemical other than PCBs. For PCBs, DTSC concurs with the decision to use the EPA slope factors (see DTSC comment 4, above).

6. **Comment:** **Attachment B, the second to last paragraph concerning VOCs in the environment.**

The Navy states that VOCs do not bioaccumulate in the environment, and consequently, were not evaluated in the calculation of revised cleanup values. This is a significant change from the methodology previously presented in the risk assessment in which the ingestion of homegrown produce was the driver exposure pathway in developing the cleanup goals presented in the existing ROD. Because of this, the Navy should present further justification in the ESD letter (in addition to Attachment B) for eliminating this exposure pathway for VOCs. Otherwise, the Navy should calculate the VOC bioaccumulation values as before under the approved ROD.

In addition, the text that follows this statement in support of not including VOCs within the bioaccumulation calculations is technically misleading. VOCs in fact do persist within soils (including surface soils depending upon soil type and soil cover) for periods of time beyond 30 years under certain conditions. If this were not the case, the VOC material currently being detected in soil and groundwater throughout portions of Hunters Point and other parts of the Bay Area would not be present at this time and remediation would not be necessary. As the sampling data indicate, this is not the case. Additionally, if VOCs are expected to be "lost" during tilling, planting, or food preparations, there are additional issues of human health exposures through increased contact during these activities (i.e, dermal contact and inhalation) which should be addressed.

Response: The decision to not consider ingestion of homegrown produce as a pathway for volatile organic compounds was based on EPA guidance which was published after the RI was completed. The guidance, which provides the technical justification for this decision is cited in Attachment B. The ingestion, dermal contact, and inhalation pathways are considered in calculation of the soil cleanup values.

7. **Comment:** **Footnote A of Attachment A which states that "cleanup value corresponds to cancer risk of 1 x 10^{-6} or hazard index of 1, but exceeds soil saturation limits."**

The Navy should change these calculations to be consistent with the PRG, which is using the lower value between the soil saturation limit and the risk-based cleanup level.

Response: Please see the response to EPA comment 7 (above) regarding saturation limits.